4050 - MACHINE TOOLS & PRODUCTION PROCESS - I										
Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)					
Lectures	Practical	Credits			Theory		Practical Ex.		Total	
3	-	3	-	25	3Hrs.	100	-		125	
Pre-requisite		Source	Semester	Theory	Test	Total	TW	PR	Gr Total	
Nil		PRD		75	25	100	25	–	125	

Rationale: In the present age where Science & Technology forms the backbone of industry, a technician is expected to acquire level of skills and knowledge. The main objective of this subject is to make the student aware of the basics and applications of various tools/equipment and techniques used in workshop to facilitate shaping of the material into useful component.

Competencies to be developed through this course-The student will be able to identify different hand tools by name used in fitting workshop; select a proper hand tool to carry out a particular operation; measure the length, diameter and angles; identify the main parts of a centre lathe and use right accessories and tools while working on a centre lathe; calculate and select proper cutting speed of the spindle and determine the time required to carry out turning operation.

COURSE CONTENTS	Hrs	Mks
1. INTRODUCTION Hand tools and machine tools, definition & classification.	2	5
2. FITTING & FILING Tools used and classification of hand tools used in fitting- Holding tools - Bench vice, plumber vice and machine vice. Striking tools - Hammers like ball peen, straight peen, cross peen and mallet. Cutting tools -Files - Classification of files based on length, coarseness and cross section, method of ciling, pining and carding of file. Chisels - Different types of chisels namely flat, side, cross cut and diamond point chisels, chiselling operation. Scrapers - Types of scrapers and its uses. Hacksaws -Hand hacksaw and its working, sawing operation. Drilling and drill point geometry. Thread cutting tools - Taps and dies and their working. Measuring tools- Metric units- Classification of measuring instruments direct & indirect. Linear measurement instrument -Scale, Vernier Calliper, Micrometer, Vernier height gauge, Vernier depth gauge, working and their application. Angular Measurement - Try square, protractor, Vernier level protractor, angle blocks, and sine bars- their uses and finding of known and unknown angles. Marking tools - Surface plate, angle plate, scriber V- block, universal marking gauge, Vernier height gauge; its applications. Marking out on a given piece using above tools.	15	30
3. LATHE Introduction and types of lathes, size of lathes. Main parts of centre lathe, bed, head-stock - belt drive and all gear drive, tail stock carriage -apron, cross slide, compound slide and tool post. Lathe accessories- Chucks -Three jaw self-centering, four jaw independent chuck, lathe centres, carrier and catch plates, mandrels, rest - follower and steady rest. Lathe operation: Centering, facing, turning - plain and shoulder turning, tapers and taper turning, taper turning method, calculation of taper angle, chamfering, thread cutting - calculation of change wheels, thread cutting operations (internal & external), knurling, grooving, drilling, boring and counter boring, parting off. Cutting tools- Cutting tools classification – Forged, brazed tipped and solid tool, tool bit and holder, cutting tool nomenclature, types of cutting tools- turning tool, facing tool, threading tool, grooving tool and boring tool, cutting speed, feed, depth of cut	24	50

and machine time -Definition and calculation of cutting speed and machining time in turning		
4. METAL CUTTING AND CUTTING TOOLS Introduction and types of cutting tools, machine ability. Cutting tool material, its characteristics and composition. Cutting fluid – Purpose of cutting fluid, properties of cutting fluid and types of cutting fluids.	7	15
Total	48	100

REFERENCE BOOKS:

1. Workshop Technology Vol. I to II
2. Workshop Technology part I & II by Chapman.